

INFRAPIPE™
SUSTAINABLE SOLUTIONS FOR GENERATIONS TO FOLLOW

INFRAPIPE MANNINGS GRAPHS FOR DN100-3200 WITH GRADIENTS 1:5 TO 1:1000

These tables are for engineers, contractors, consultants and asset managers who are reasonably familiar with gravity hydraulic design. They show the flow rate and flow velocity for a pipe for a given gradient. For more information on Reynolds and Colebrook-White coefficients for pressure systems see the INFRAPIPE Datasheet on gradients, hydraulics, flow rates and velocities or see the materials datasheet or for the impact of fish passage on culvert selection use this Design Manual.

This document is further supported by the Design Manuals and other Datasheets available from INFRAPIPE, please see the INFRAPIPE website for more details and visit the Downloads section.

The tables show 3 different Mannings numbers for INFRAPIPE products:

- 0.009 – the recommended figure for HDPE pipes in NZS4404:2010 *Land development and subdivision infrastructure*
- 0.011 – which makes a moderate allowance for sediment, debris or the entrainment of air
- 0.013 – which can be suitable for an application with heavy sedimentation and debris

The NZ Building Code, NZTA (P-46) and KiwiRail stipulate **0.011 for HDPE and 0.013 for concrete.** This translates to a difference of hydraulic capacity of 18-23%.

The tables are in colour first and then repeated in B/W (for printing). Then for each Mannings number the tables are split by gradient:

- ✓ One for significant gradients from 1:5 to 1:100 (0.02 to 0.1), the other for 1:100 to 1:1000 (0.01 to 0.001)

For each gradient group there are then two tables:

- ✓ Firstly DN100:DN1000, then DN1000-DN3200

For INFRAPIPE 375+, the DN is exactly the ID, below that 300=298, 225=218,150=147,100-98)

Starting with a flow rate and gradient, trace up the gradient line to intercept the flow rate and select the **pipe size (solid line)** above it.

To obtain the **flow velocity**, then **follow the gradient up to the dashed line for that pipe size** and read the flow velocity.

These tables are guides only and final calculation should still be performed for design.



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SOME COOL PROJECTS INFRAPIPE™ INFRATANK

AUCKLAND PORT
DN2500
CUSTOM BEND AND RISER

AUCKLAND
4*DN2500
PULLPITS

AUCKLAND
48m DN1500

AUCKLAND AIRPORT
DN2500
MANHOLE

WAIHEKE
13m DN1600
and DN1550
PILE LINERS

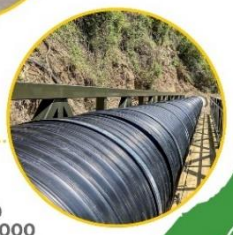
PUKEKOHE
60m DN1000
SOLID WALL
UNDER RAILWAY

MORRINSVILLE
26m DN2500
CULVERT

HAMILTON
86m³ DN2500
WASTE WATER TANK

HAMILTON
204m³ TANK DN3200
+908m DN 525/600

TAMAHERE
86m³ DN2500
FIRE FIGHTING TANK



NELSON
31m DN900
TO REPLACE
DESTROYED
WATER MAIN

NELSON
240m DN600
and 18m DN1000
FOR AQUACULTURE

BLENHEIM
32*DN1500
MANHOLES
FOR GROWING
PLANTS

CHRISTCHURCH
28m DN700 and
DN2000 MANHOLE

HAWKES BAY
32m DN3200

INVERCARGILL
34m DN2500

TAURANGA
180m DN900
22DEG GRADIENT 4 MANHOLES

TAURANGA
DN2500
& DN2000
CLARIFIER

TAURANGA
40m DN3200
SN40+
WITH RISER
AND BEND

HAWKES BAY
40m DN3200

NORTHLAND
AUCKLAND
WAIHEKE
PUKEKOHE
MORRINSVILLE
HAMILTON
TAURANGA
TAMAHERE
WAIKATO
BAY OF PLENTY
GISBORNE
NEW PLYMOUTH
TARANAKI
HAWKE'S BAY
MANAWATU-WANGANUI
NORTH ISLAND
WELLINGTON
NELSON
BLENHEIM
TASMAN
MARLBOROUGH
WEST COAST
CHRISTCHURCH
CANTERBURY
SOUTH ISLAND
OTAGO
SOUTHLAND
INVERCARGILL

This is just a sample of the projects we have fulfilled showing how versatile, how strong and how easy to handle our KRAH™ HDPE product is.

ISO 9001 Certified ApprovalMark
ISO TYPE 5 AS/NZS 4130:2018 AMI:74999
ISO TYPE 5 AS/NZS 5065:2005 AMI:74961
NEW ZEALAND MADE

CONTACT OUR TEAM: infrapipe.co.nz | sales@infrapipe.co.nz | 09 869 3030 | 3 Averton Place East Tamaki, Auckland 2013 | INFRAPIPE NZ



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PIPES

WHICH PIPE FOR FLEXIBLE PIPE

INFRAPIPE operates two types of equipment – the helical KRAH plant for complex and larger pipes, and the twinwall plant for smaller and simpler applications. The twinwall makes product in 3 stiffness ratings – SN6, 8 & 16. The KRAH by contrast can make any SN rating from 1.5 to 40+. Please use this table below to confirm which sizes are available for which applications.

Note the KRAH **machine also makes solid wall** in DN450-2000 see later pages for sizing tables to achieve the required PN/SDR.

DN	FARMPIPE SN 6 Twinwall	CIVILPIPE8 SN 8 Twinwall	CIVILPIPE16 SN 16 Twinwall	FITTINGS	ECOPIPE SN 4	INFRAPIPE SN 2-40+
100	For rural or forestry	For standard drainage solutions	For standard drainage solutions	Use Fernco fittings	Use for non-civil applications if EF welds, couplers, custom bends, custom lengths, smooth outer layer required or if size not available	Use for full range of civil applications with custom bends, connections, manholes etc. Solid wall available to match all common sizes and PN ratings
150						
200						
225				Stock items made from PVC, PP or HDPE		
300						
375						
450						
525				Custom or Krah		
600						
700						
800				Use Krah pipe to make custom fittings and adaptors as required		
900						
1000						
1100						
1200						
1350						
1500						
1600						
1800						
2000						
2300						
2500						
3200						

Pipe Flow Relationships for Different Combinations of Diameter, Velocity and Gradient
For HDPE/PP pipes with low wear or sedimentation

INFRAPIPE™
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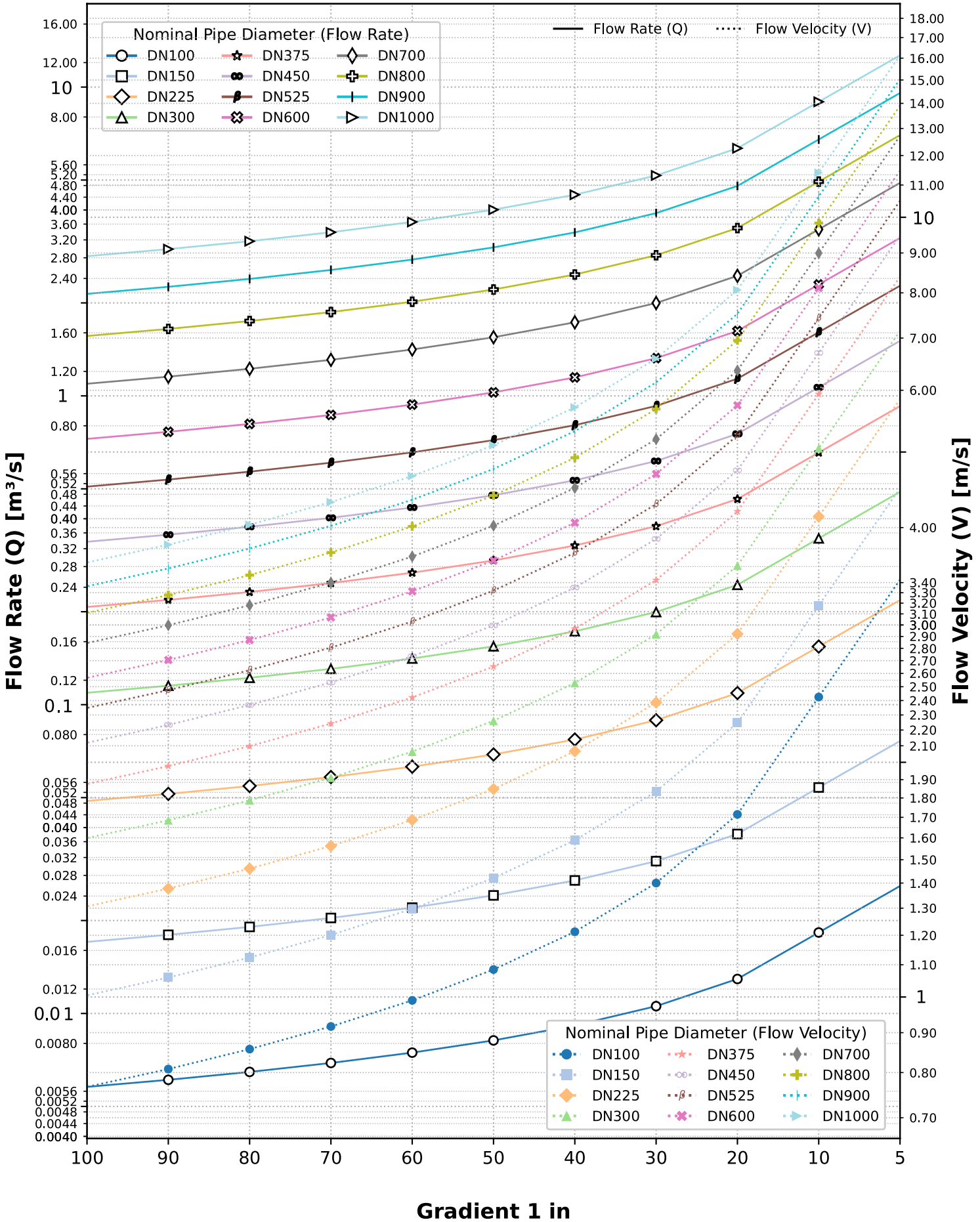
Mannings number 0.011

DN100-DN1000
Gradient 1:10 to 1:100 (0.1-0.01)



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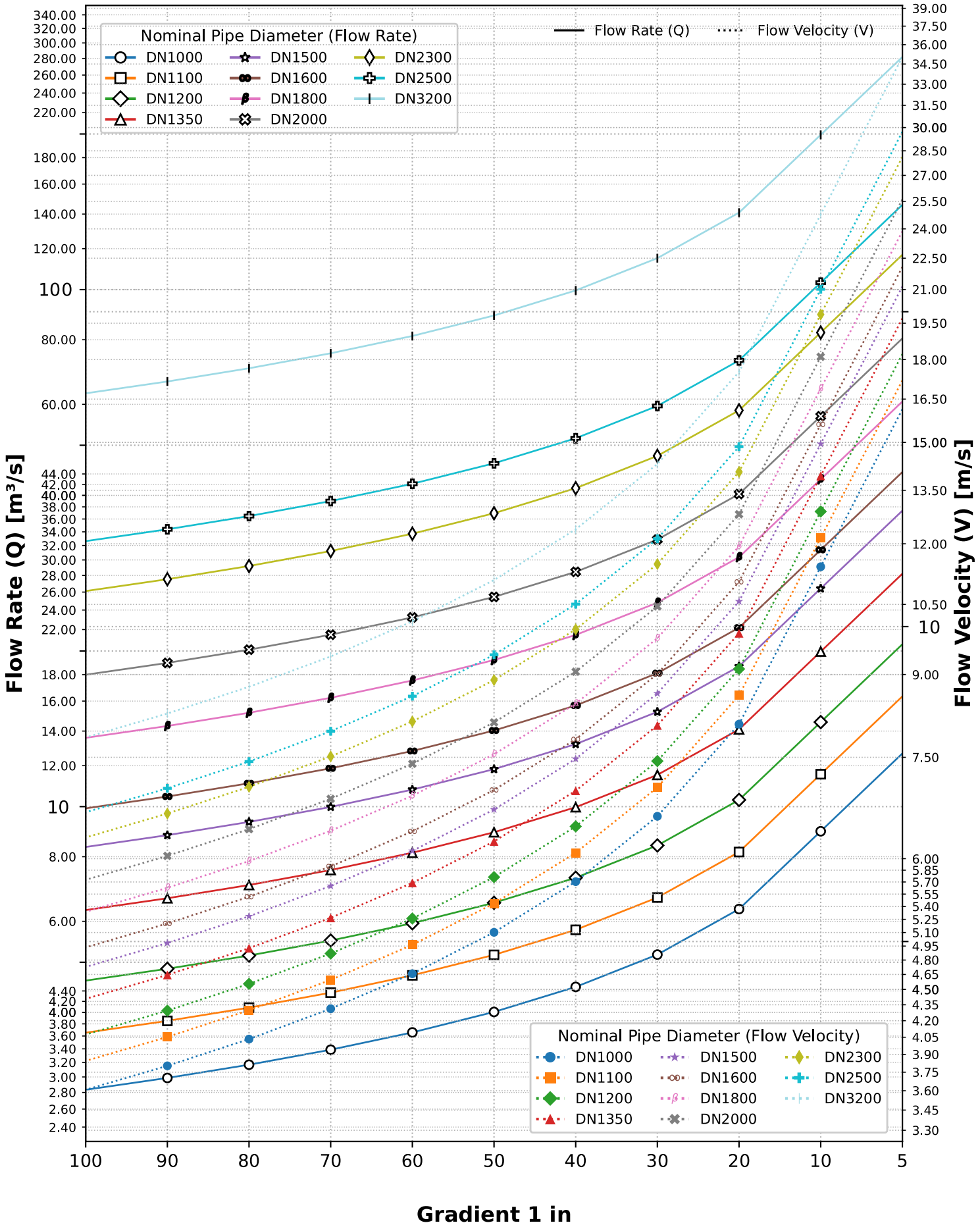
Mannings number 0.011

DN1000-DN3200
Gradient 1:10 to 1:100 (0.1-0.01)



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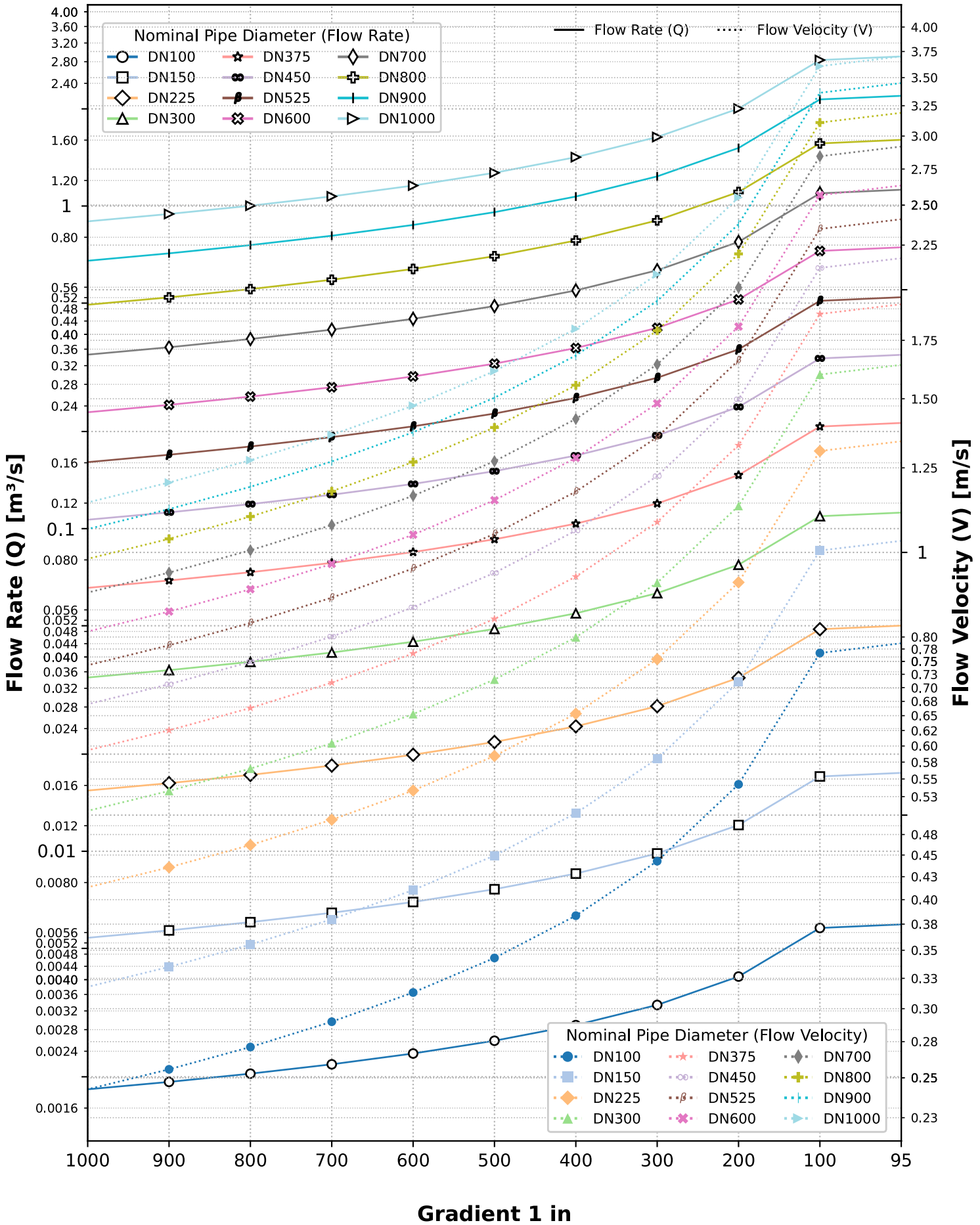
Mannings number 0.011

DN100-DN1000
Gradient 1:100 to 1:1000 (0.01-0.001)



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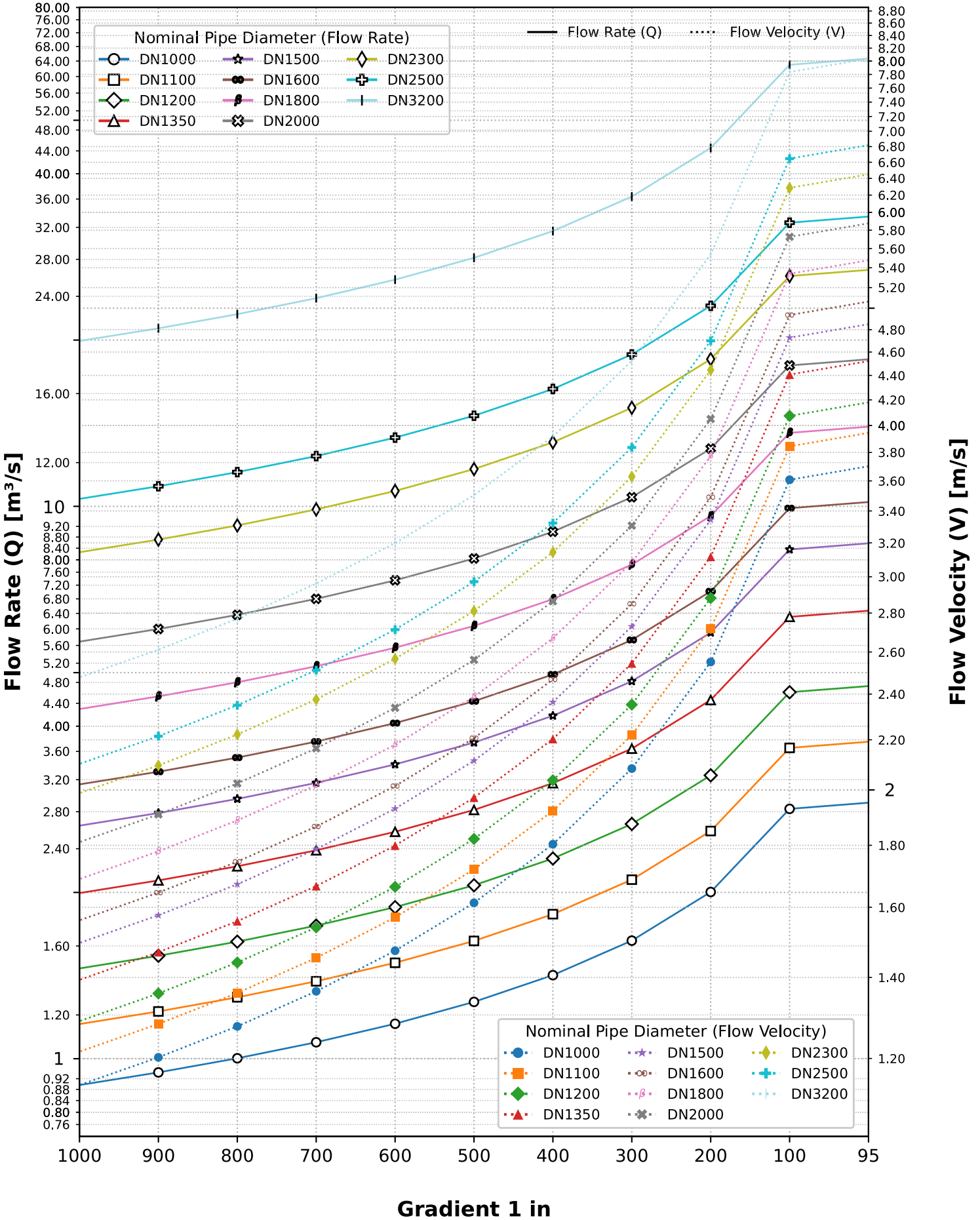
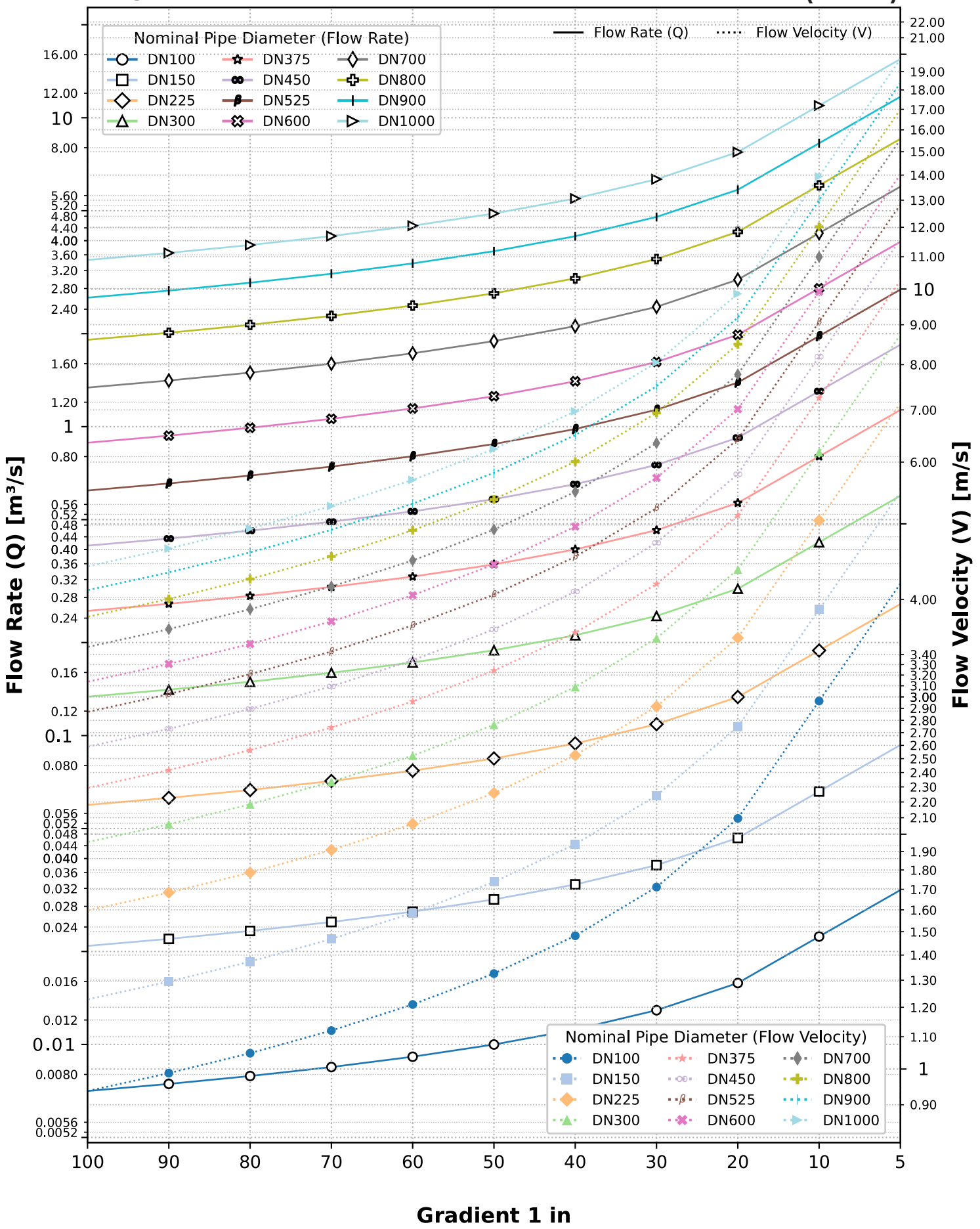


Pipe Flow Relationships for Different Combinations of Diameter, Velocity and Gradient.
For HDPE/PP pipes with very low or nil sedimentation

INFRAPIPE™
SUSTAINABLE SOLUTIONS FOR GENERATIONS TO FOLLOW

Mannings number 0.009

DN1000-DN3200
Gradient 1:10 to 1:100 (0.1-0.01)



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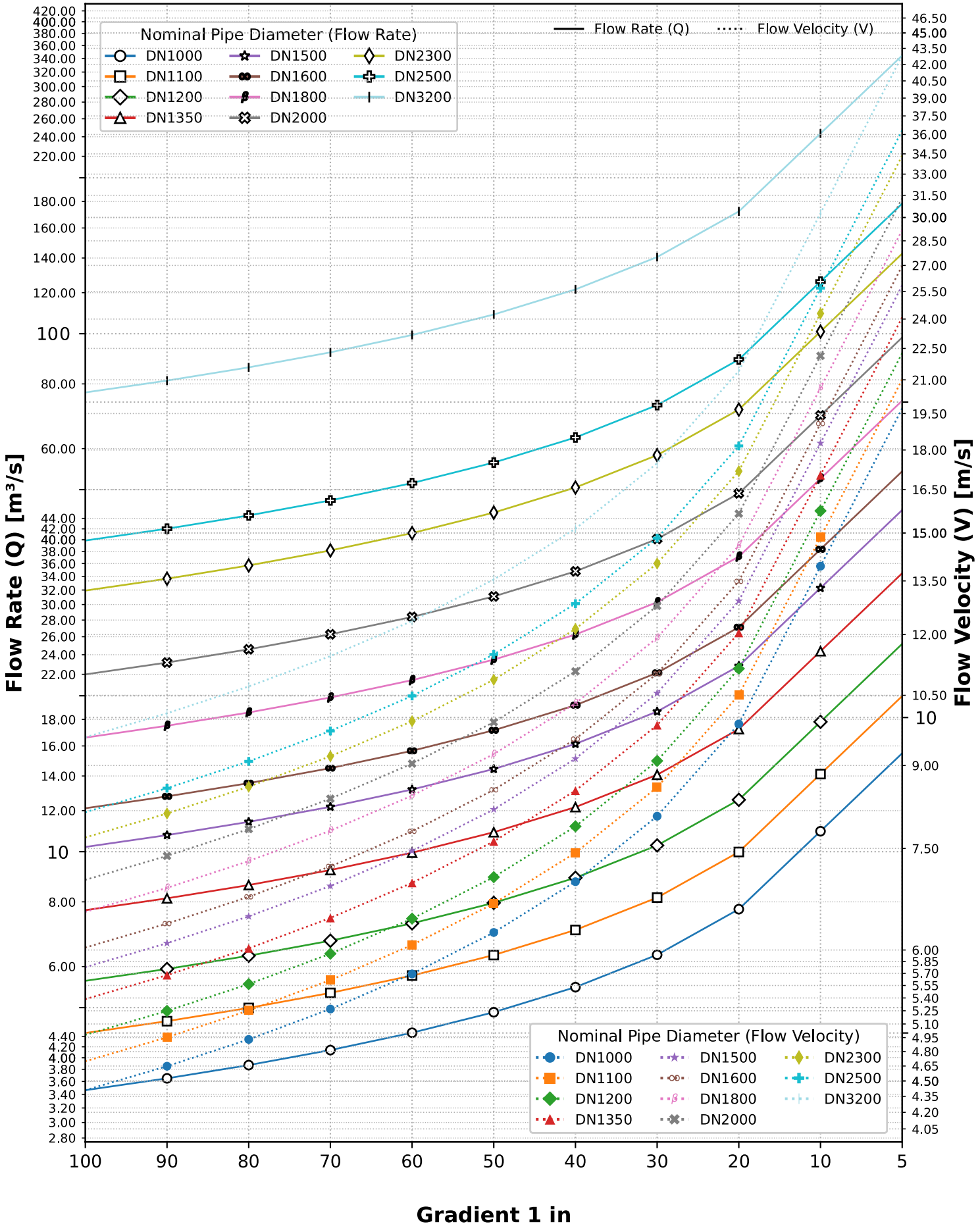

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For HDPE/PP pipes with very low or nil sedimentation

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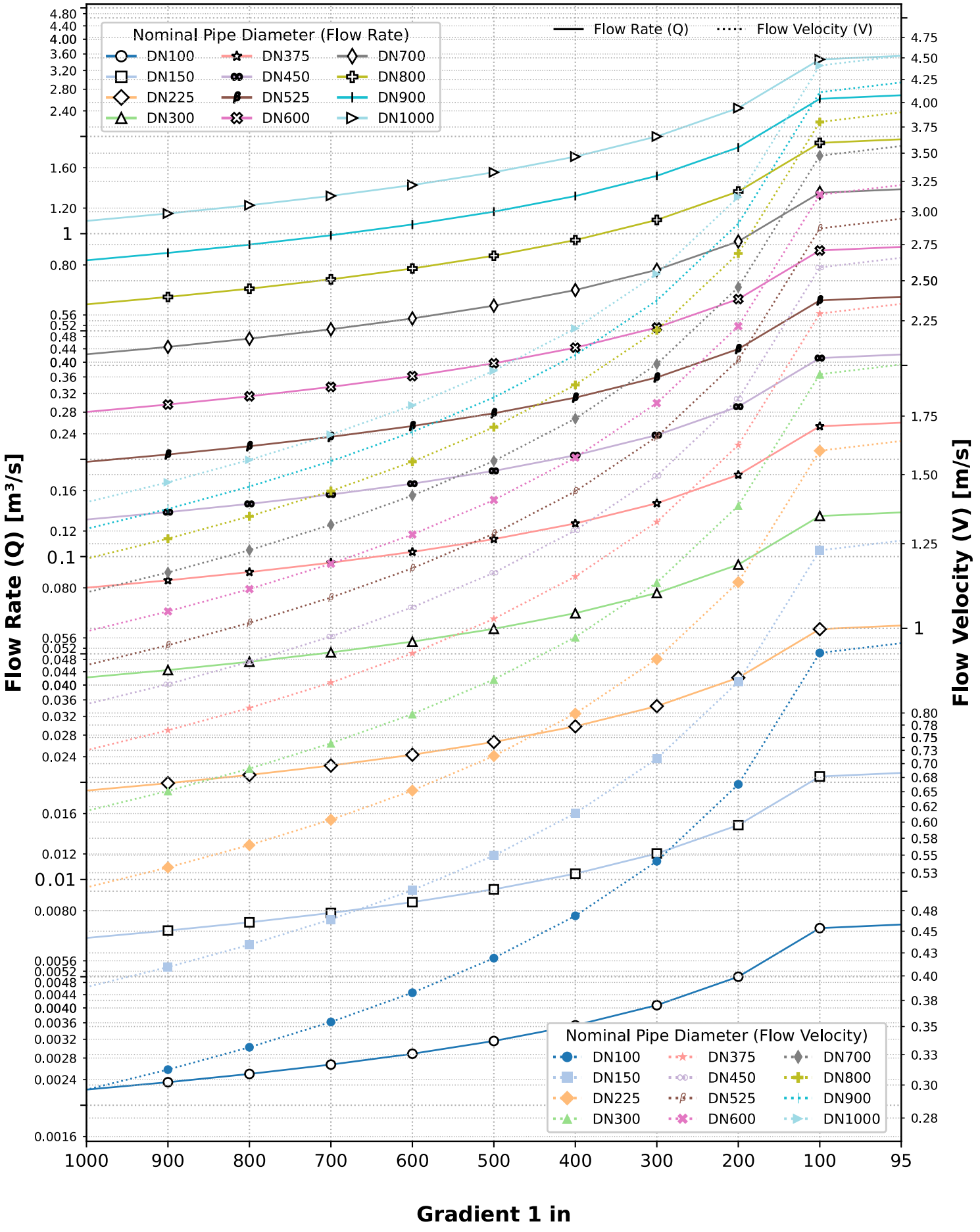
DN100-DN1000
Gradient 1:100 to 1:1000 (0.01-0.001)



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For HDPE/PP pipes with very low or nil sedimentation

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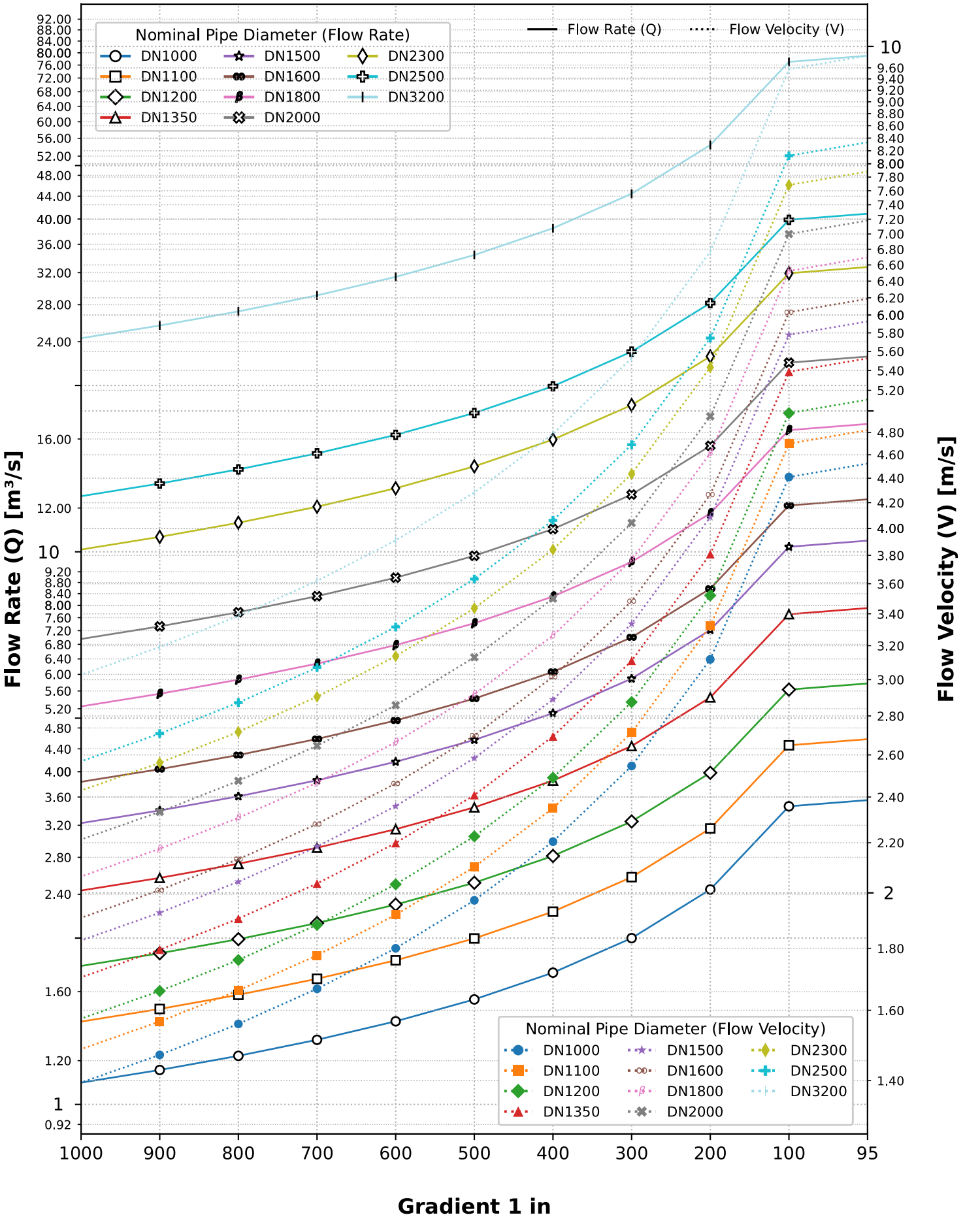
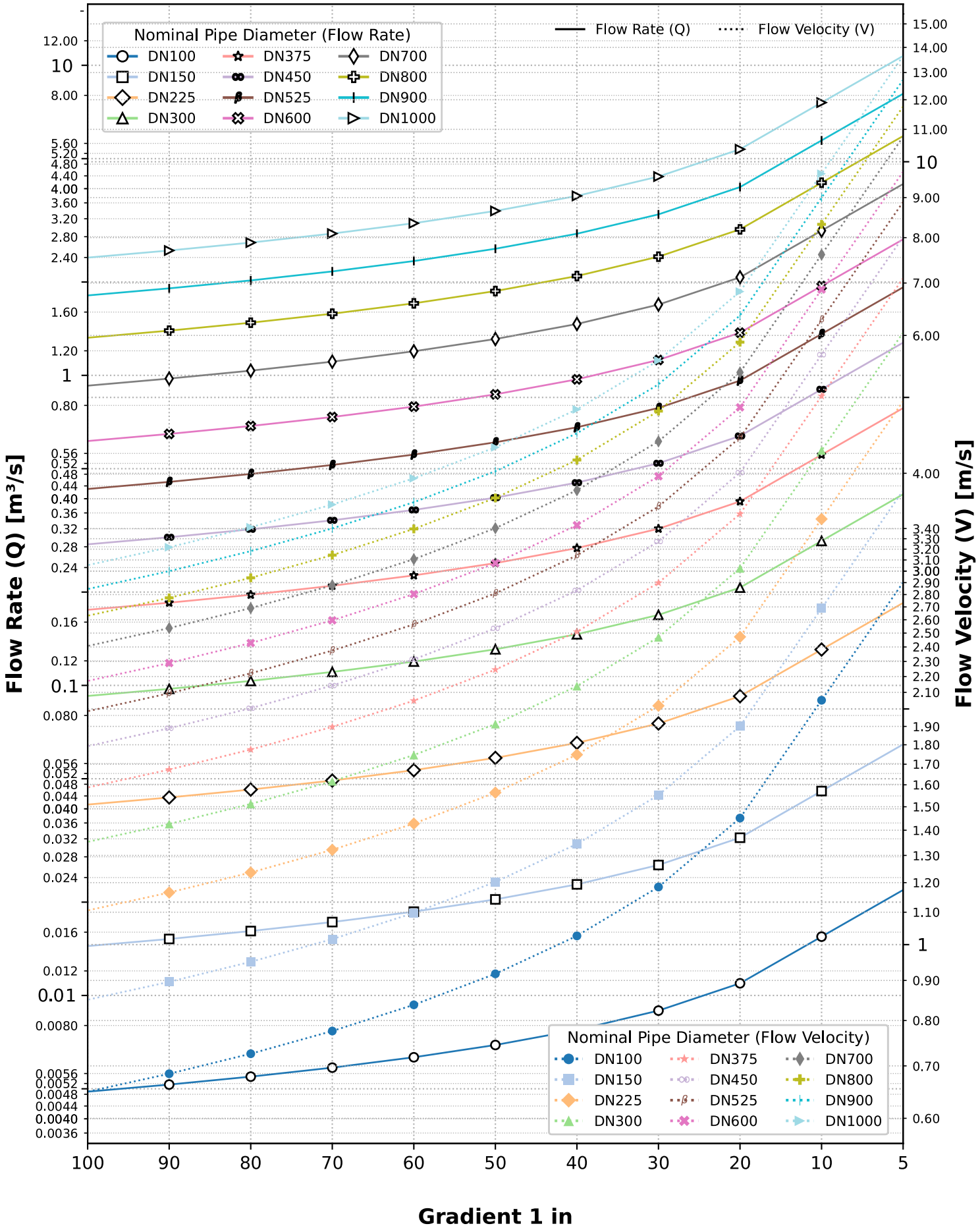


Pipe Flow Relationships for Different Combinations of Diameter, Velocity and Gradient.
For HDPE/PP pipes with wear and sedimentation

INFRAPIPE™
SUSTAINABLE SOLUTIONS FOR GENERATIONS TO FOLLOW

Mannings number 0.013

DN100-DN1000
Gradient 1:10 to 1:100 (0.1-0.01)



Pipe Flow Relationships for Different Combinations of Diameter, Velocity and Gradient.
For HDPE/PP pipes with wear and sedimentation

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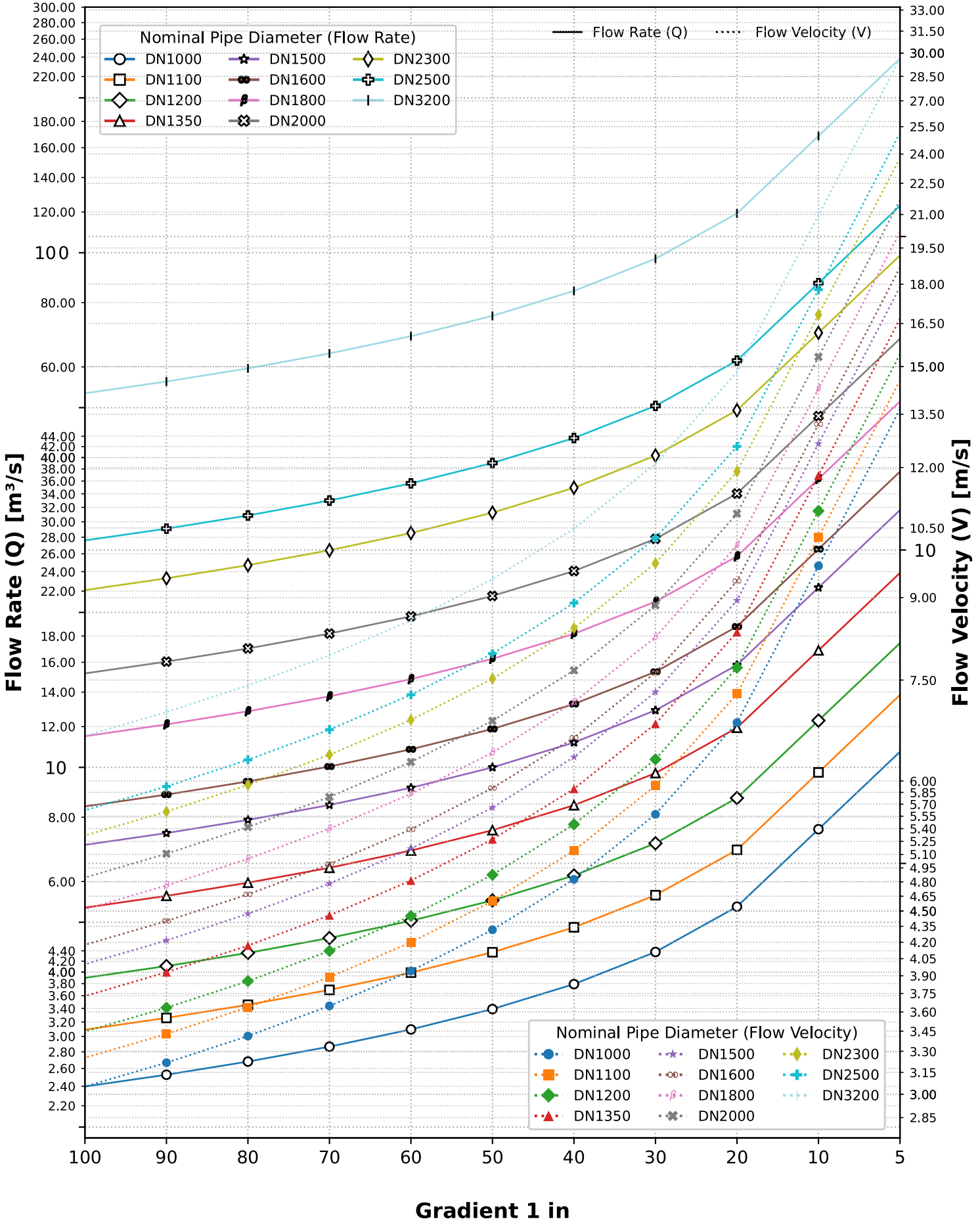
SUSTAINABLE SOLUTIONS FOR GENERATIONS TO FOLLOW

Mannings number 0.013

DN1000-DN3200
Gradient 1:10 to 1:100 (0.1-0.01)



Pipe Flow Relationships for Different Combinations of Diameter, Velocity and Gradient.
For HDPE/PP pipes with wear and sedimentation

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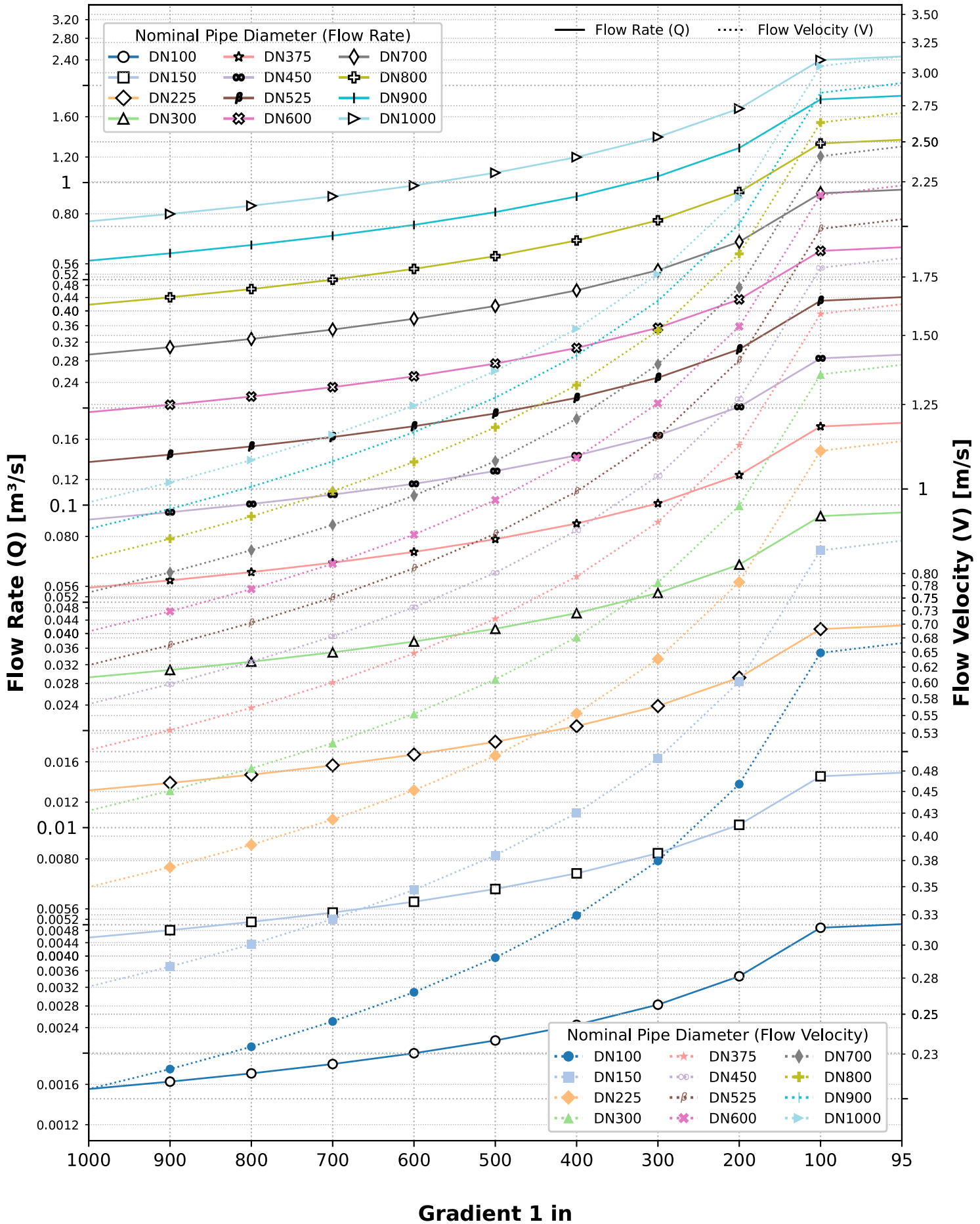
DN100-DN1000
Gradient 1:100 to 1:1000 (0.01-0.001)



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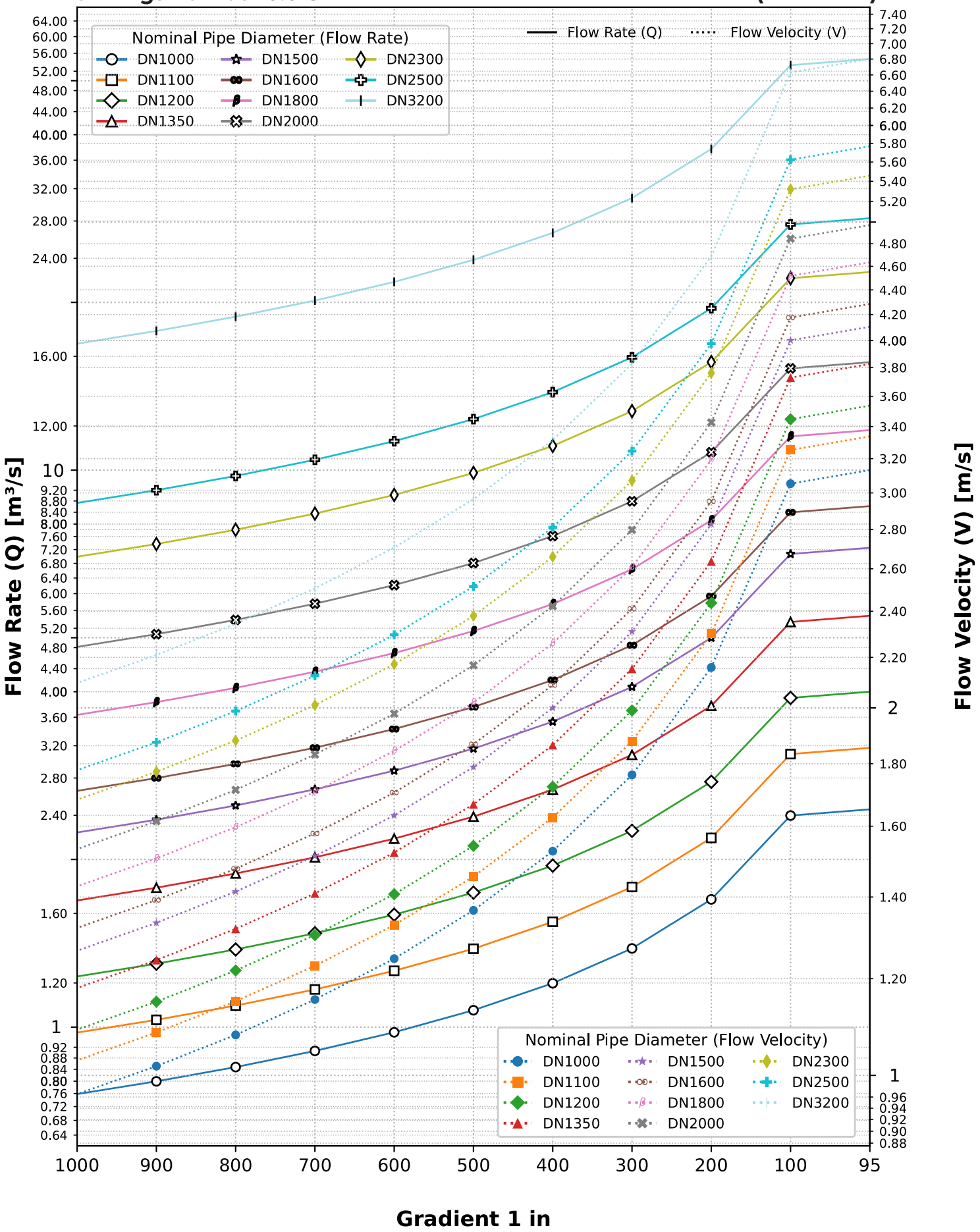
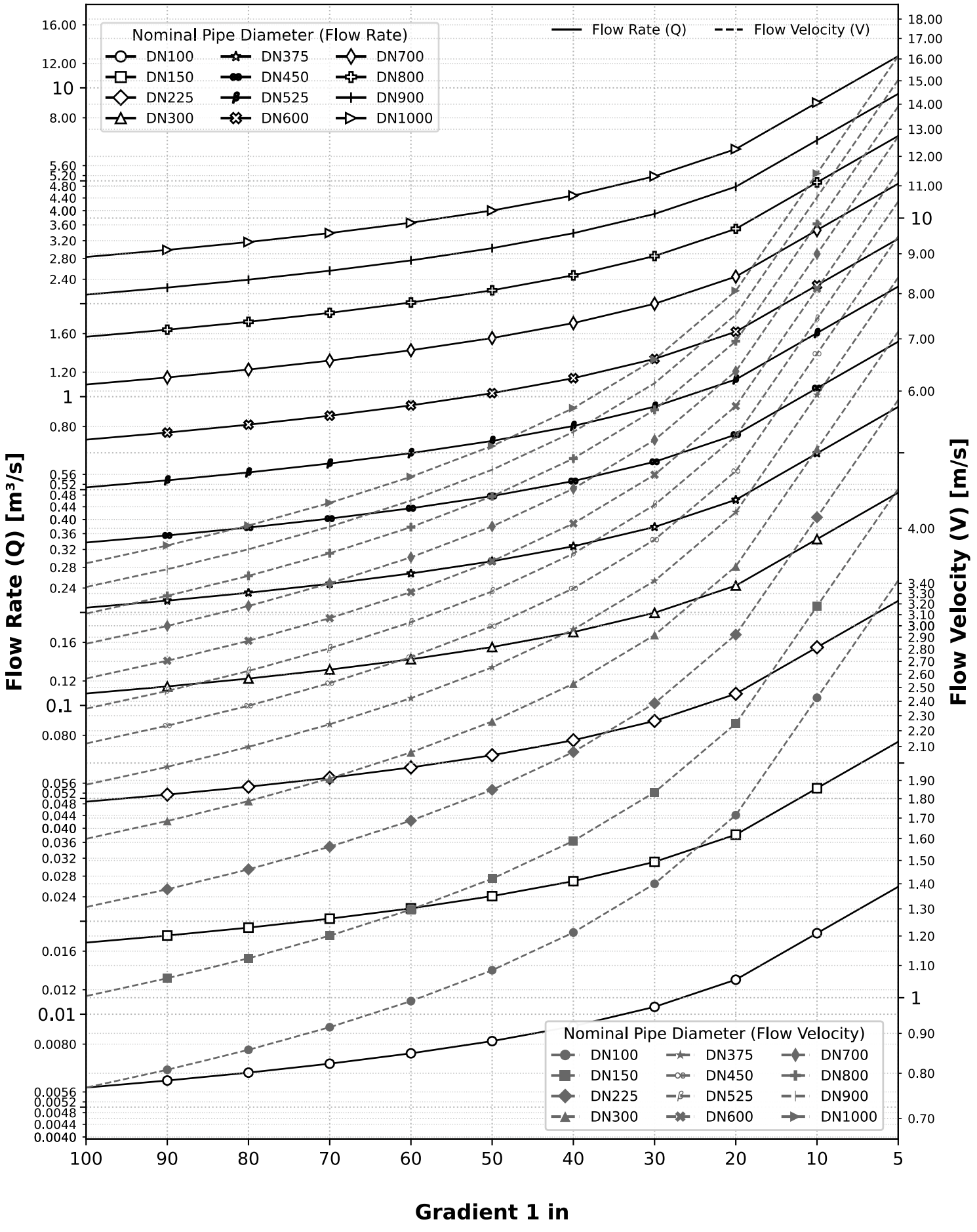


Pipe Flow Rates Relationships for different combinations of Diameter, Velocity and Gradient.
For HDPE/PP pipes with low wear or sedimentation

INFRAPIPE™
SUSTAINABLE SOLUTIONS FOR GENERATIONS TO FOLLOW

Mannings number 0.011

DN100-DN1000
Gradient 1:5 to 1:100 (0.2-0.01)



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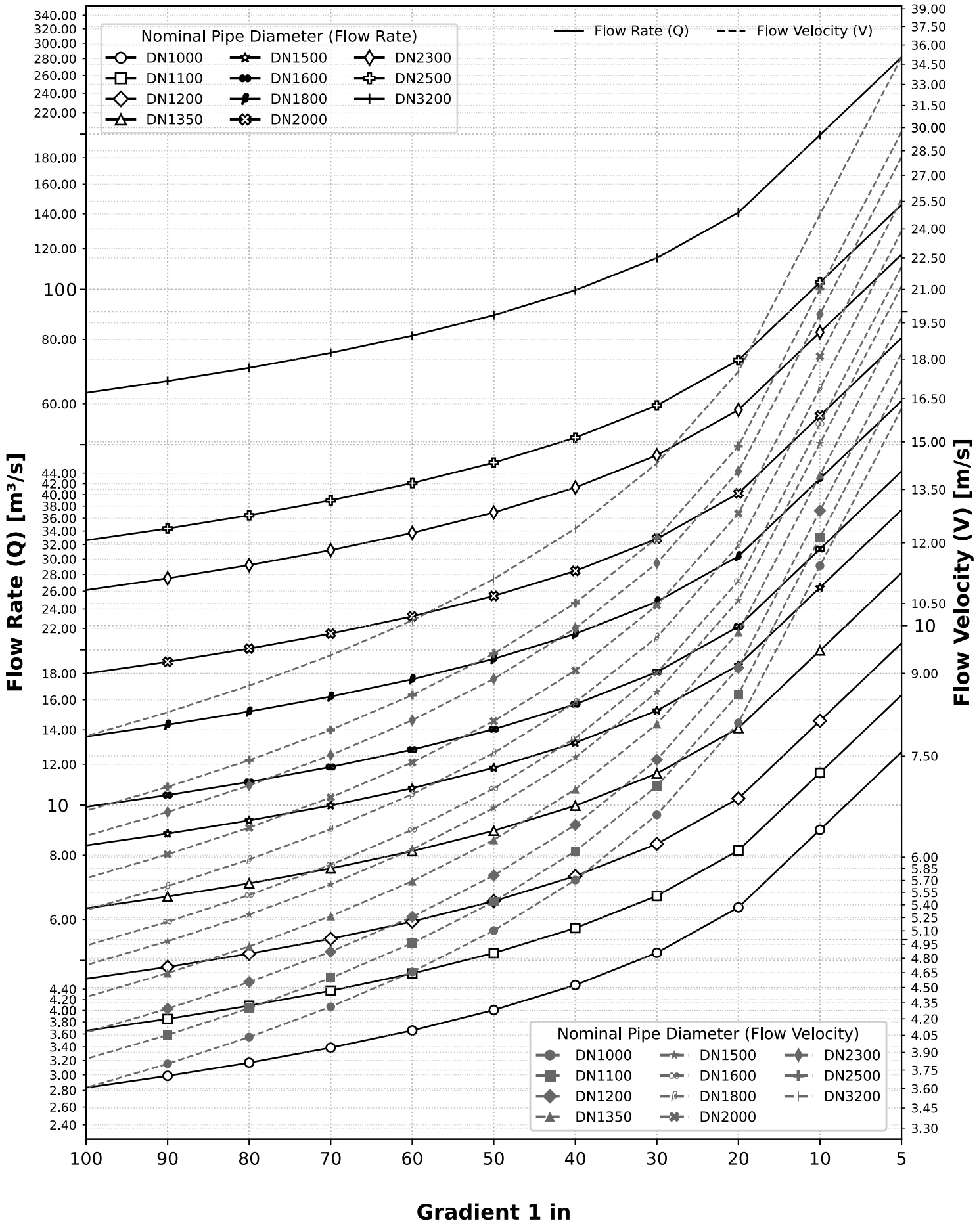

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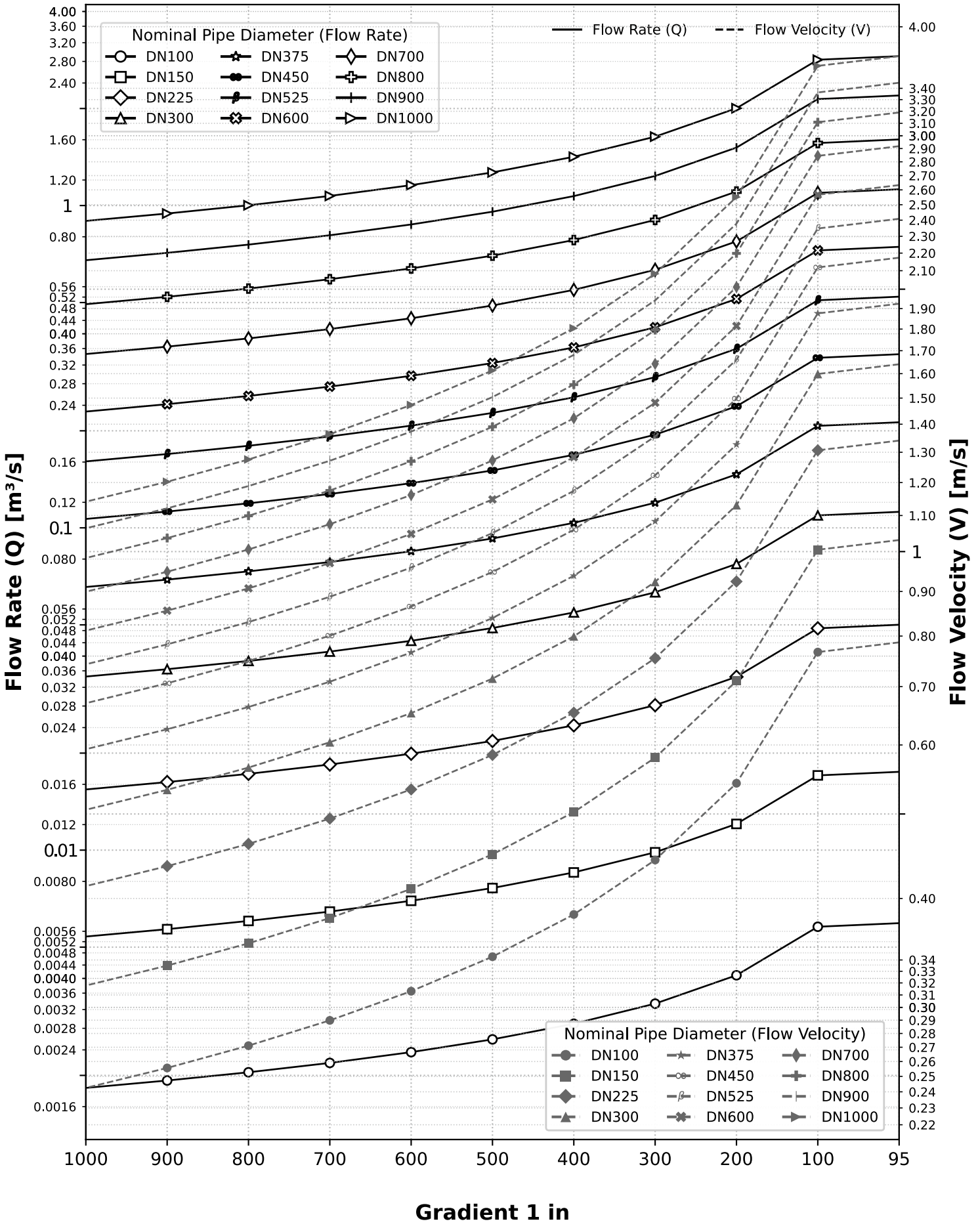
Gradient 1:100 to 1:1000 (0.01-0.001)



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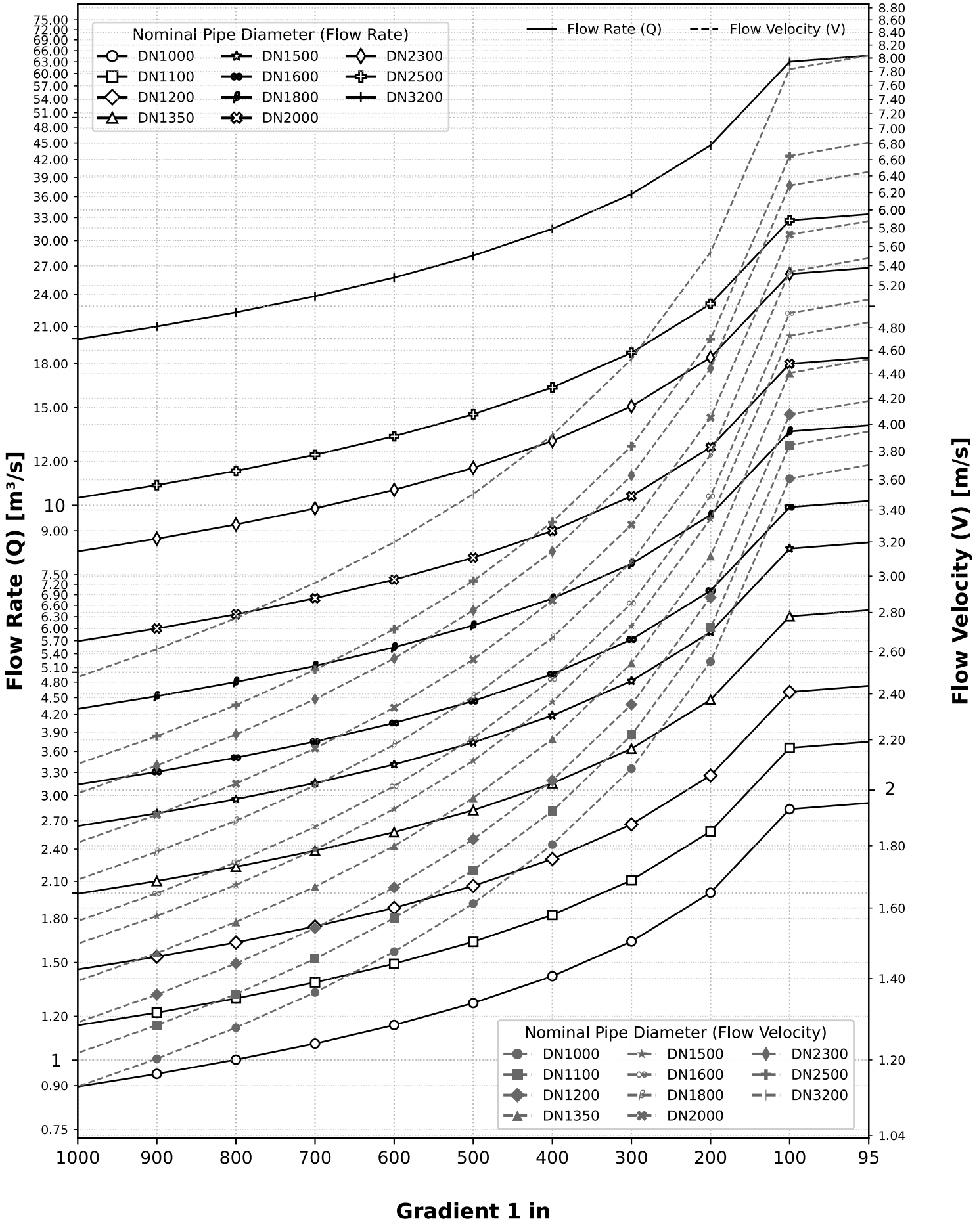
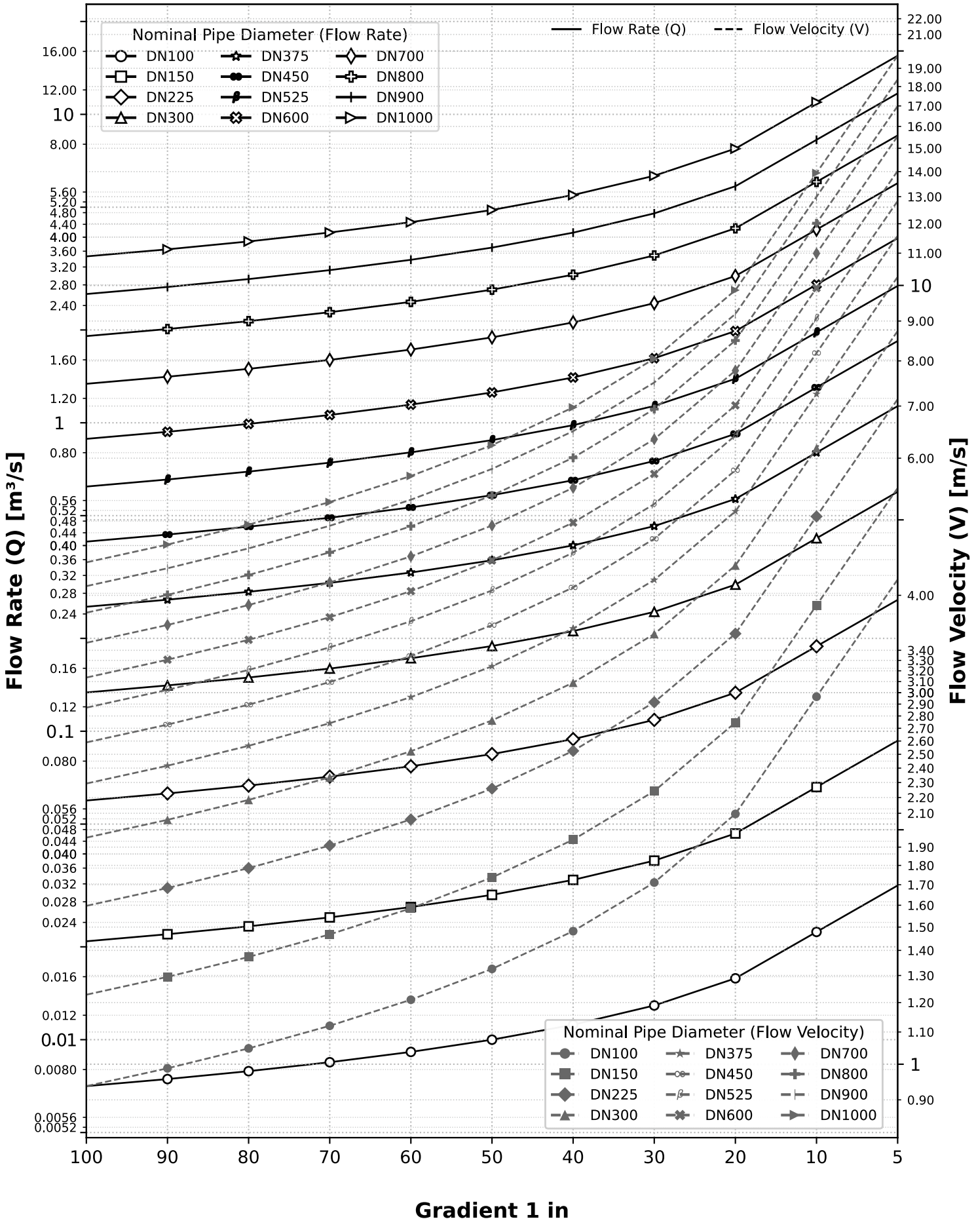


Pipe Flow Rates Relationships for different combinations of Diameter, Velocity and Gradient.
For HDPE/PP pipes with very low or nil sedimentation

INFRAPIPE™
SUSTAINABLE SOLUTIONS FOR GENERATIONS TO FOLLOW

Mannings number 0.009

DN100-DN1000
Gradient 1:5 to 1:100 (0.2-0.01)



Pipe Flow Rates Relationships for different combinations of Diameter, Velocity and Gradient.
For HDPE/PP pipes with very low or nil sedimentation

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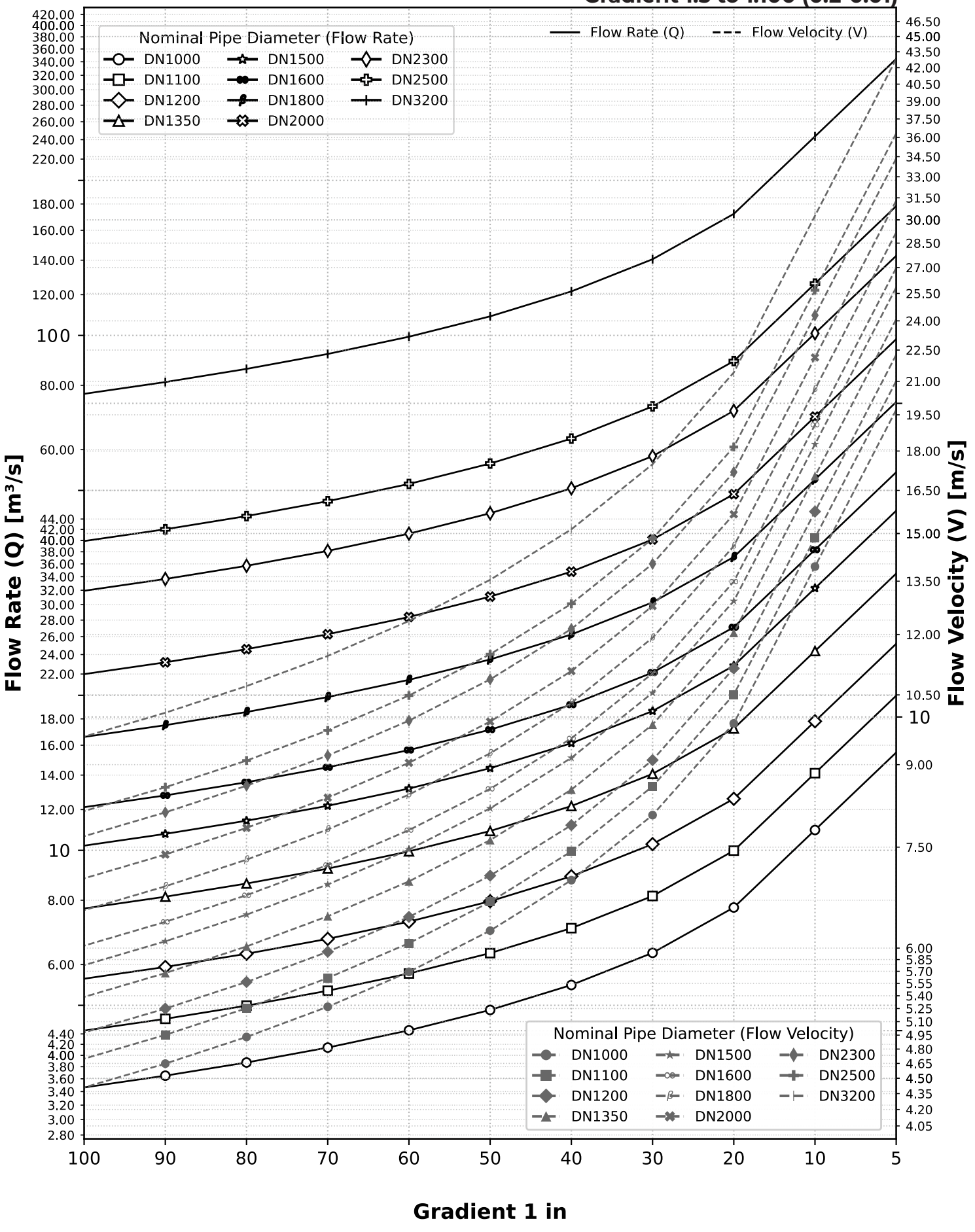
DN1000-DN3200
Gradient 1:5 to 1:100 (0.2-0.01)

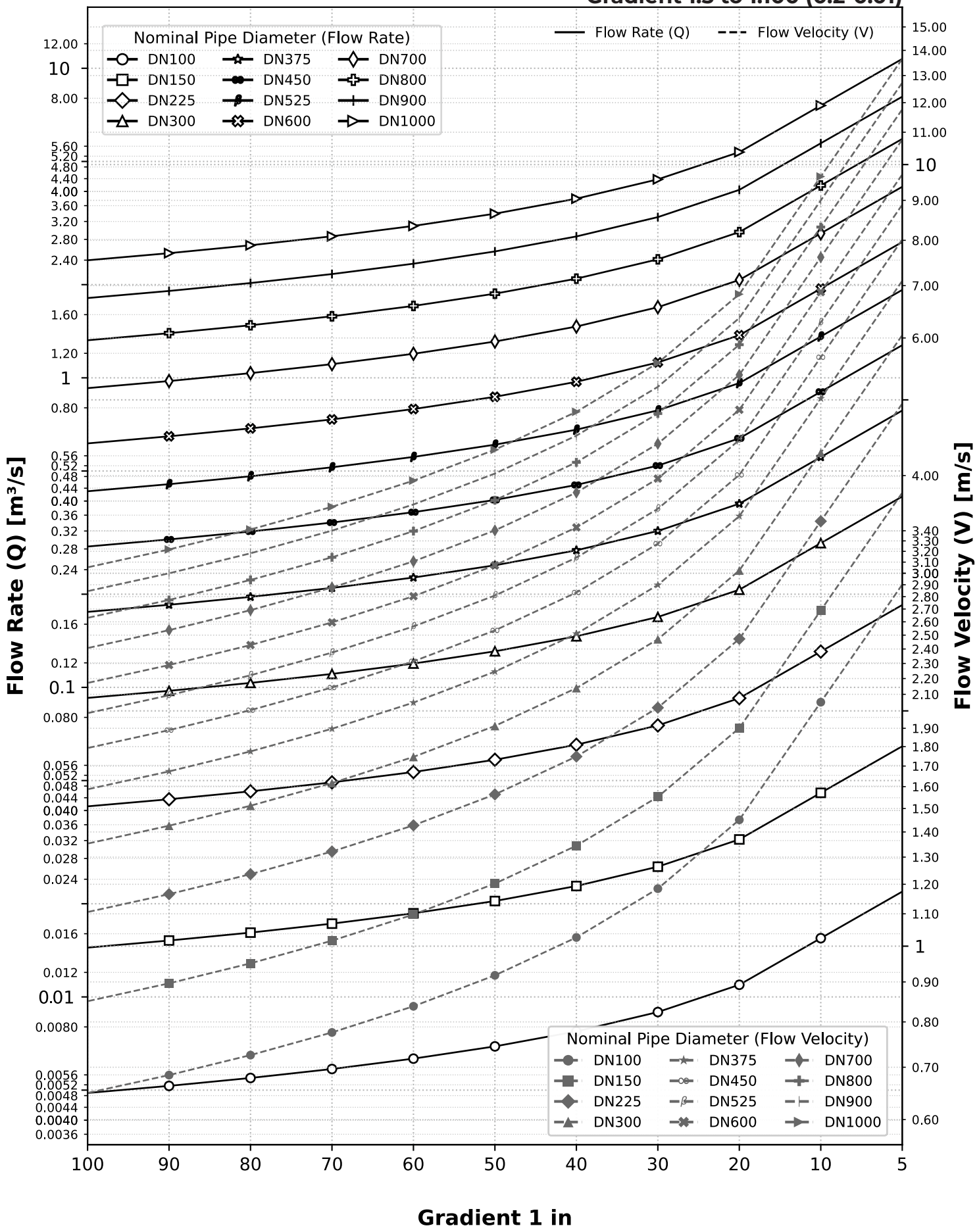


Pipe Flow Rates Relationships for different combinations of Diameter, Velocity and Gradient.
For HDPE/PP pipes with wear and sedimentation

INFRAPIPE™
SUSTAINABLE SOLUTIONS FOR GENERATIONS TO FOLLOW

Mannings number 0.013

DN100-DN1000
Gradient 1:5 to 1:100 (0.2-0.01)

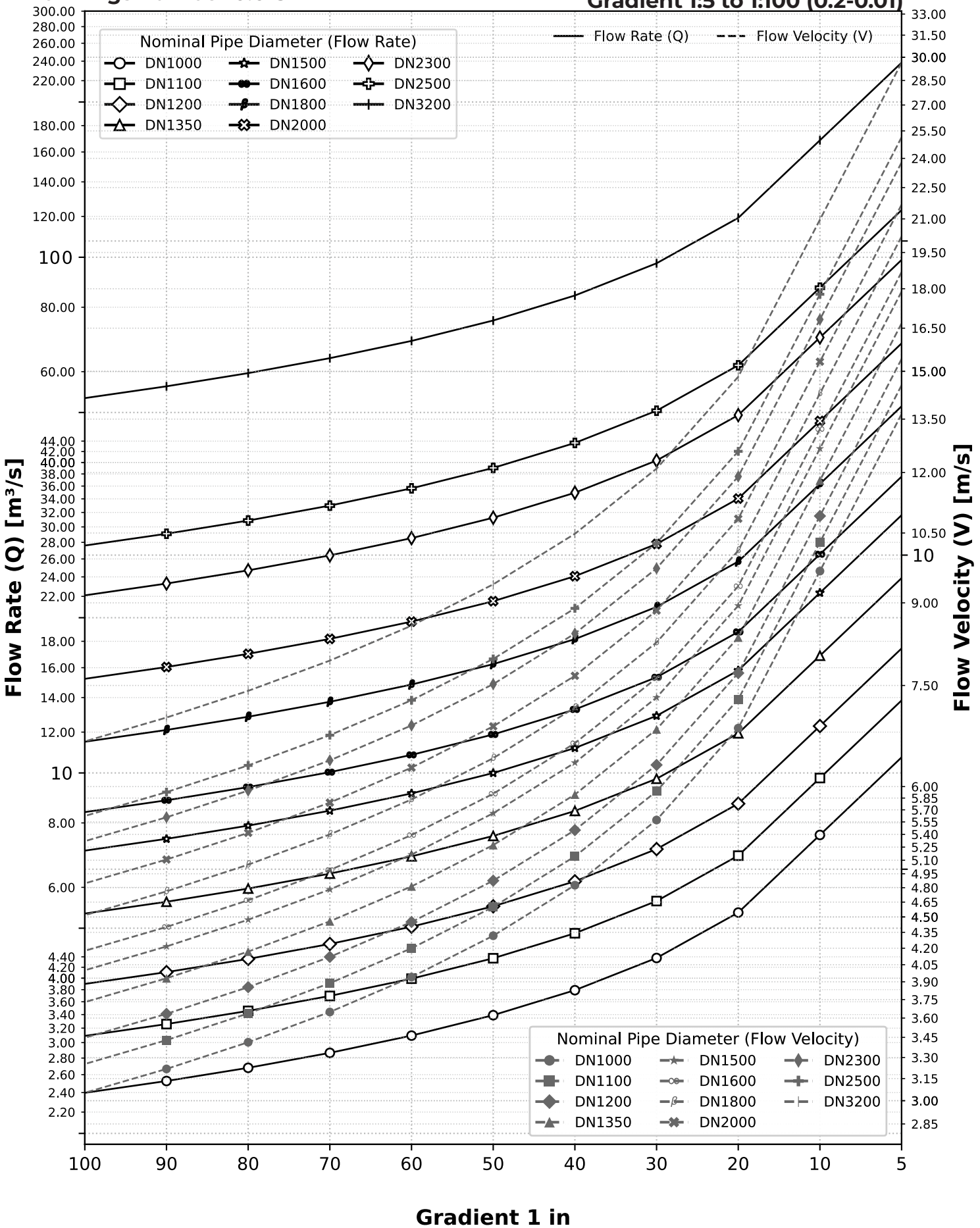


Pipe Flow Rates Relationships for different combinations of Diameter, Velocity and Gradient.
For HDPE/PP pipes with wear and sedimentation

INFRAPIPE™
SUSTAINABLE SOLUTIONS FOR GENERATIONS TO FOLLOW

Mannings number 0.013

DN1000-DN3200
Gradient 1:5 to 1:100 (0.2-0.01)



Pipe Flow Rates Relationships for different combinations of Diameter, Velocity and Gradient.
For HDPE/PP pipes with very low or nil sedimentation

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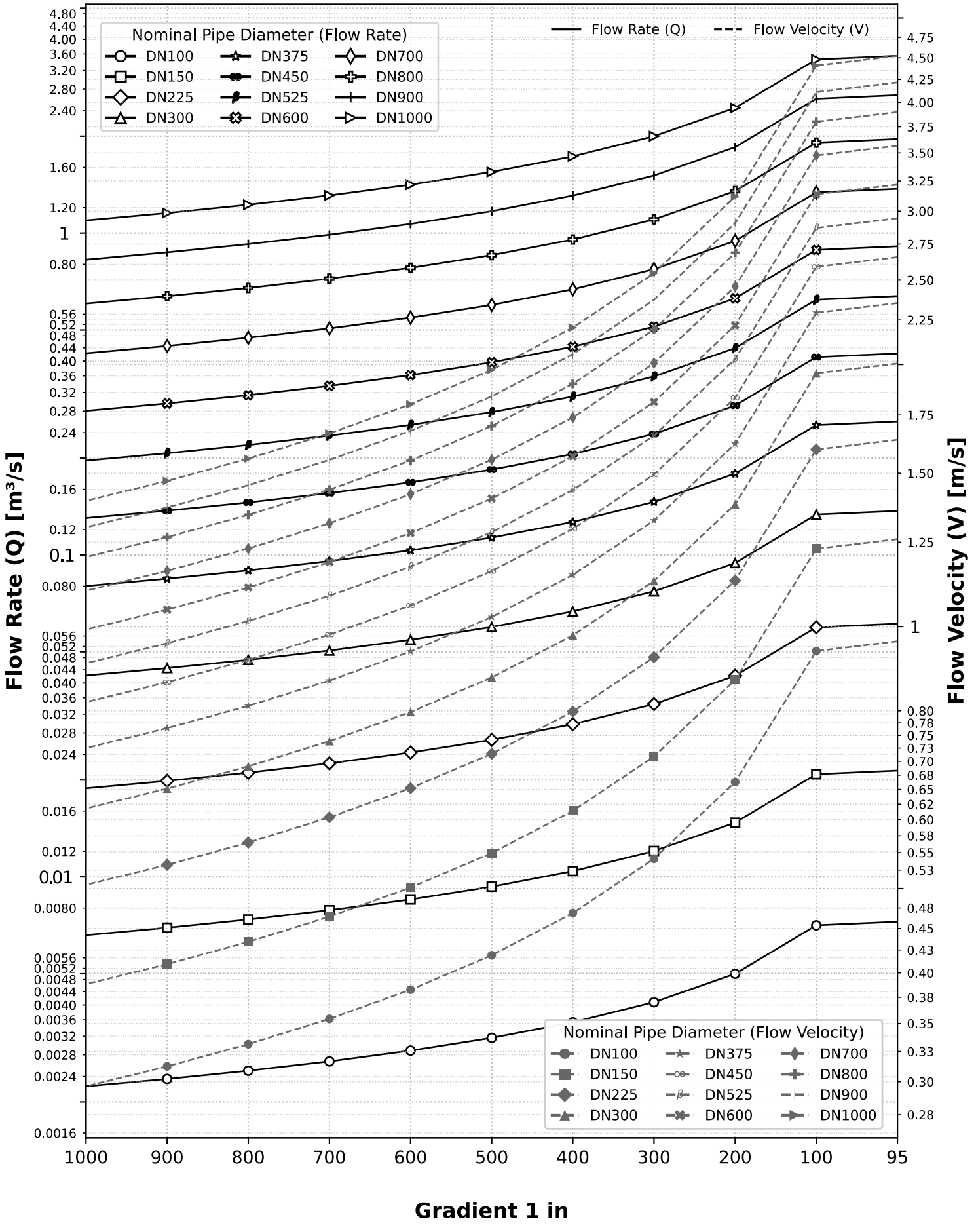
Mannings number 0.009

DN100-DN1000
Gradient 1:100 to 1:1000 (0.01-0.001)



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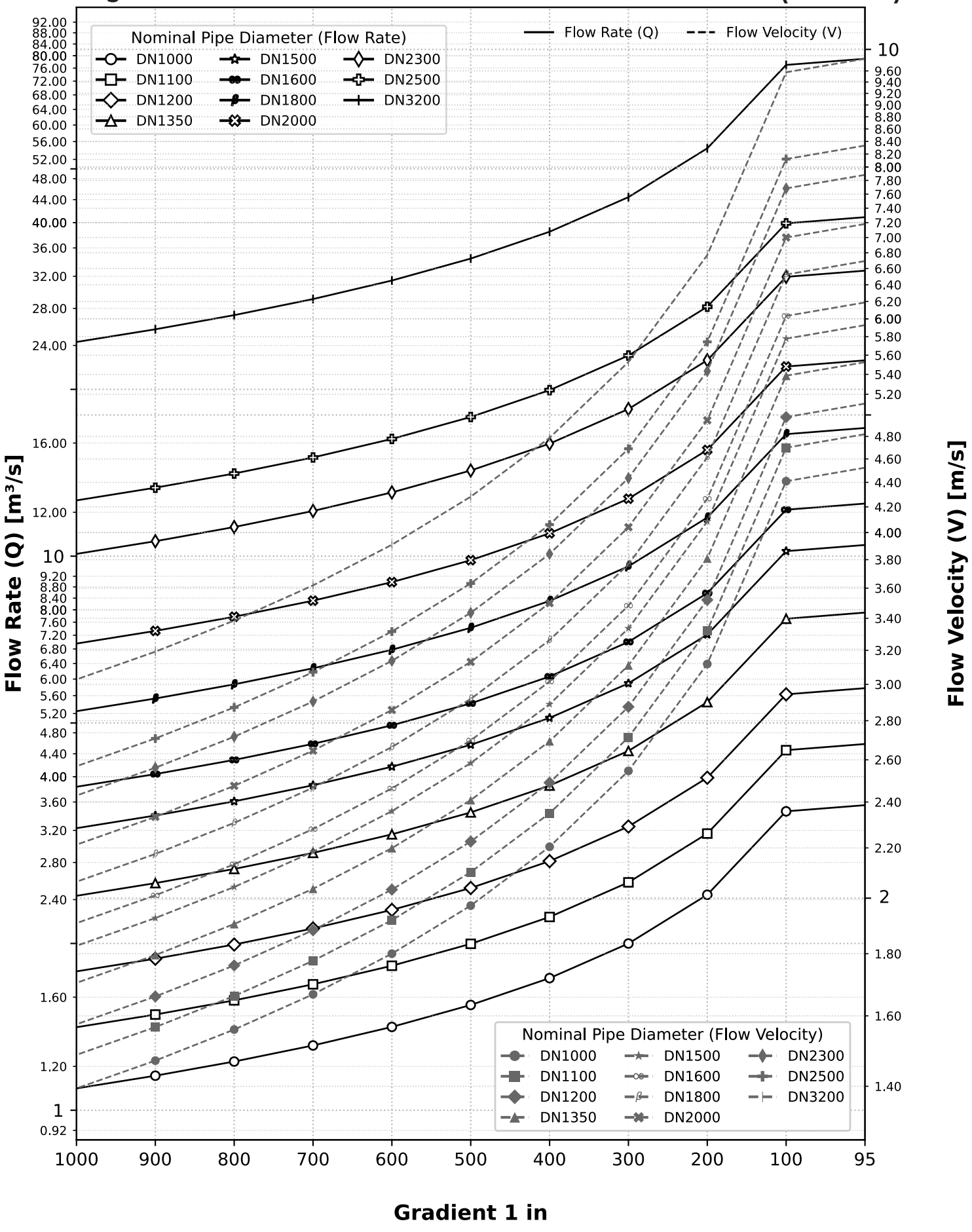
Gradient 1:100 to 1:1000 (0.01-0.001)



Pipe Flow Rates Relationships for different combinations of Diameter, Velocity and Gradient.
For HDPE/PP pipes with wear and sedimentation

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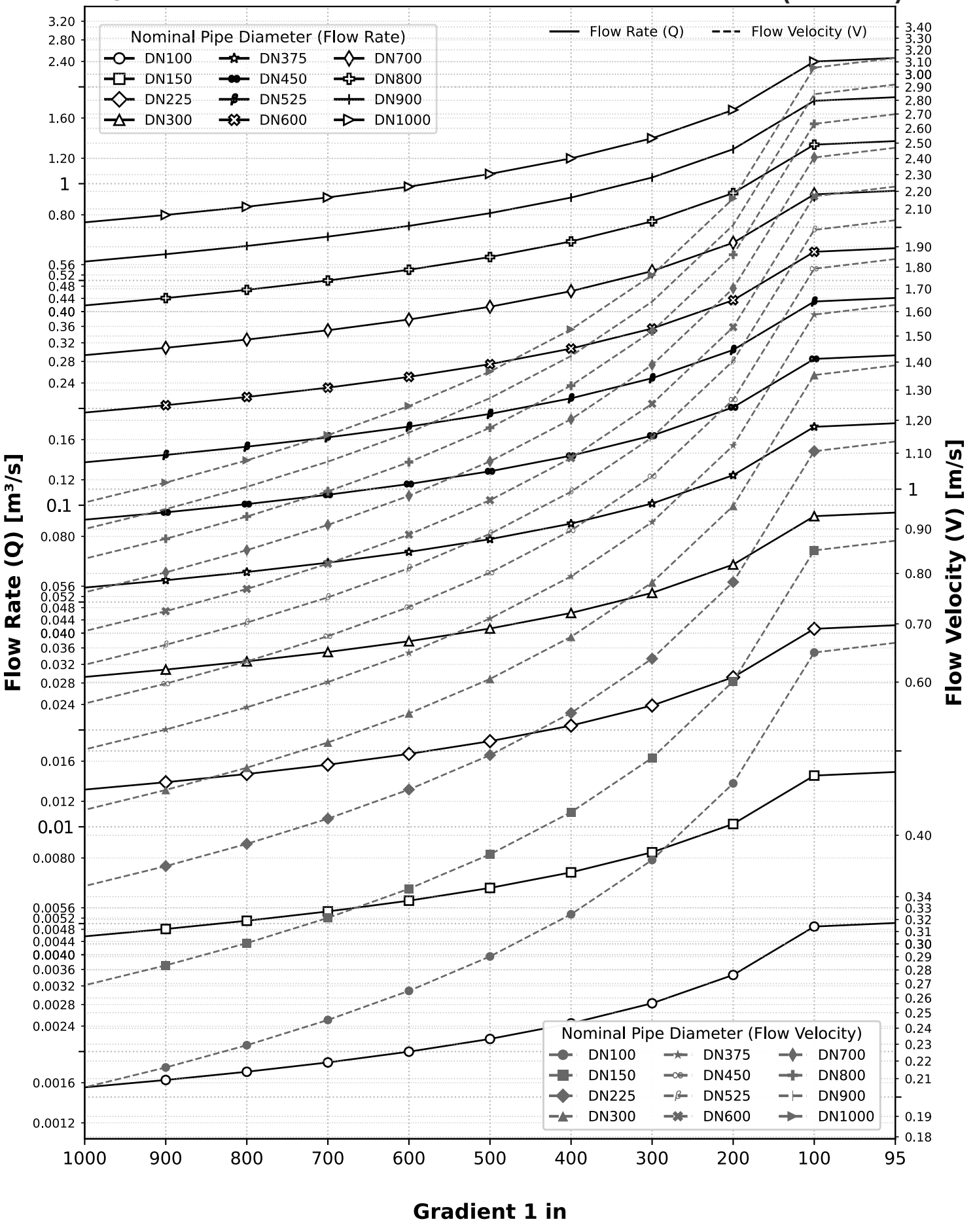
Mannings number 0.013

DN100-DN1000
Gradient 1:100 to 1:1000 (0.01-0.001)



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